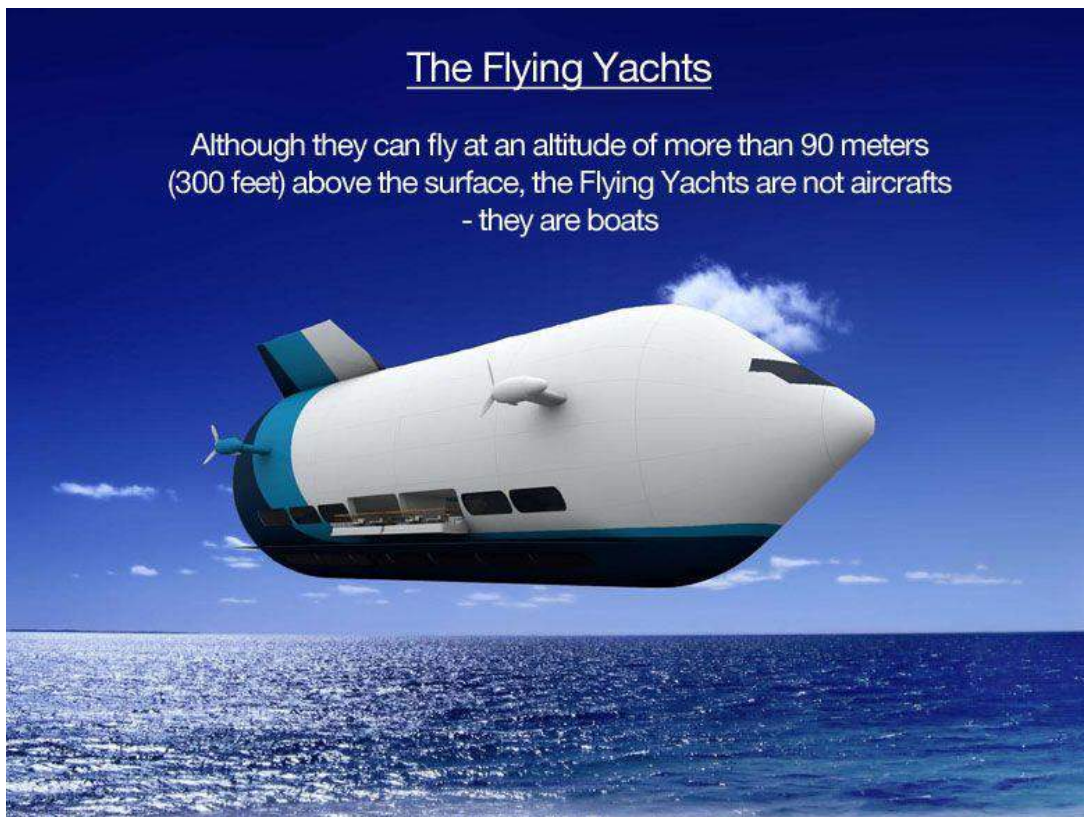


Flying-Yacht, Inc.

Peter Lobner, updated 10 March 2022

1. Introduction

Hokan Colting is an airship designer, pilot and the founder / owner of Flying-Yacht, Inc., located in Newmarket, Ontario, Canada. His firm, founded in 2012, is designing and developing the Flying-Yacht semi-buoyant, semi-rigid tourist airship, which is designed as a wing-in-ground effect (WIG) vessel that will cruise in ground effect at altitudes of 30 - 90 meters (98 – 295 feet) above the water and offer an unparalleled sightseeing experience for several dozen passengers. Development has progressed to the prototype stage.



Flying-Yacht in flight. Source: Flying-Yacht, Inc.

The external appearance of the Flying-Yacht airship concept bears a resemblance to the non-rigid Voyager airship developed by Colting and 21st Century Airships (2007 – 2009) and the related Bullet airship developed E-Green Technologies (EGT) in 2009 – 2012.

2. The Prototypes

Flying-Yacht, Inc. claims credit for two prototypes that appear to be the same prototypes that were developed previously by 21st Century Airships and EGT to validate the designs of their Voyager and Bullet airships.



This Flying-Yacht prototype appears to be the hull of the former EGT Bullet 125 sub-scale prototype, which flew in 2008. In 2007, it flew in a different configuration as the 21st Century Airships Voyager sub-scale prototype.



This larger Flying-Yacht prototype appears to be the hull of the former EGT Bullet 580 full-size prototype, which was delivered to Moffett Field, CA in 2011 for flight testing, but was never completed and flight tested.



To test the wing-in-ground-effect characteristics of the Flying-Yacht, narrow “wings” have been installed along the flanks of the hull.

Source, all prototype photos: octuri.com



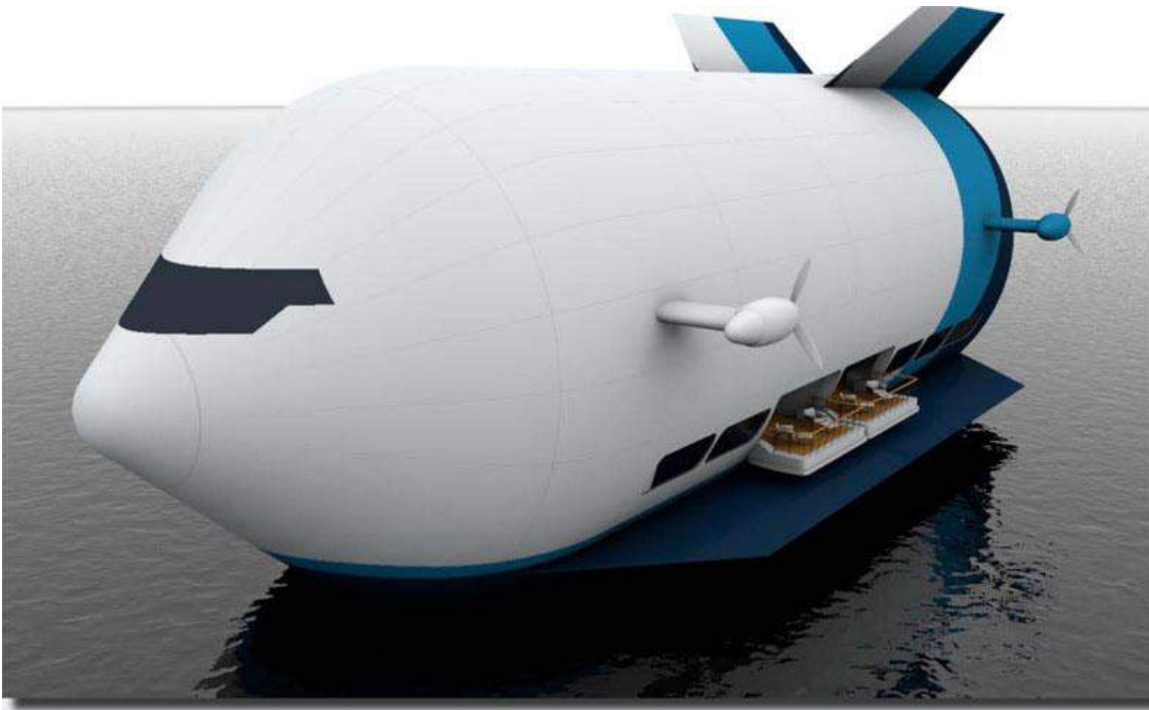
Top: Interior view of the larger Flying-Yacht prototype.

Middle: External view of the new piloting station to be installed at the nose of the airship.

Bottom: Interior view of the new piloting station.

3. Full-scale Flying-Yacht concept

This semi-buoyant WIG airship will takeoff and land on water. It has four small stub pylons, each with an electrically-driven vectorable propeller. The airship gains lift and becomes airborne because of ground effect acting on the airframe and wings when the airship is moving close to the water surface at speeds of up to 110 kph (68 mph). Ground effect depends on forward motion, with lift increasing as forward speed increases. A stopped airship will settle back on the water surface.



Flying-Yacht floating on the water. Source: Flying-Yacht, Inc. via CharterWorld.com

Hokan Colting describes the Flying-Yacht WIG vessel design in detail in two patents:

- **US2013/0068879A1**, “Wing-in Ground Effect Vessel,” Inventor: Hokan Colting, filed: 15 September 2011, granted: 21 March 2013:
<https://patents.google.com/patent/US20130068879A1/en?q=US8245966>

- **WO2013085589A3**, “Improved wing-in-ground effect vessel,”
Inventor: Hokan Colting, filed 17 September 2012, published:
22 August 2013:
<https://patents.google.com/patent/WO2013085589A3>

In the US patent, Colting explains:

“A WIG (wing in ground effect) vessel includes a hull with wings attached. The WIG vessel includes means for propulsion as well as altitude and directional control. The lift of the wings in ground effect is augmented by partial aerostatic lift, achieved through interior gas holding envelopes containing a lighter-than-air gas. The wings have a high mean chord length, for example fourteen meters or more, allowing the vessel to fly in ground effect above water at an altitude where waves are of minimal concern. The vessel has a low wing loading, below 1.5 kg/m^2 , and the wings are of uniform thickness and have an aspect ratio of less than 1. The conical fore end of the hull forces air below the surface of the wings for ground effect. Weight transfer is used to alter the pitch of the vessel.”

The major elements of this WIG vessel are shown in patent Figure 23: hull (602), passenger compartment (604), piloting station (612), wing (618)

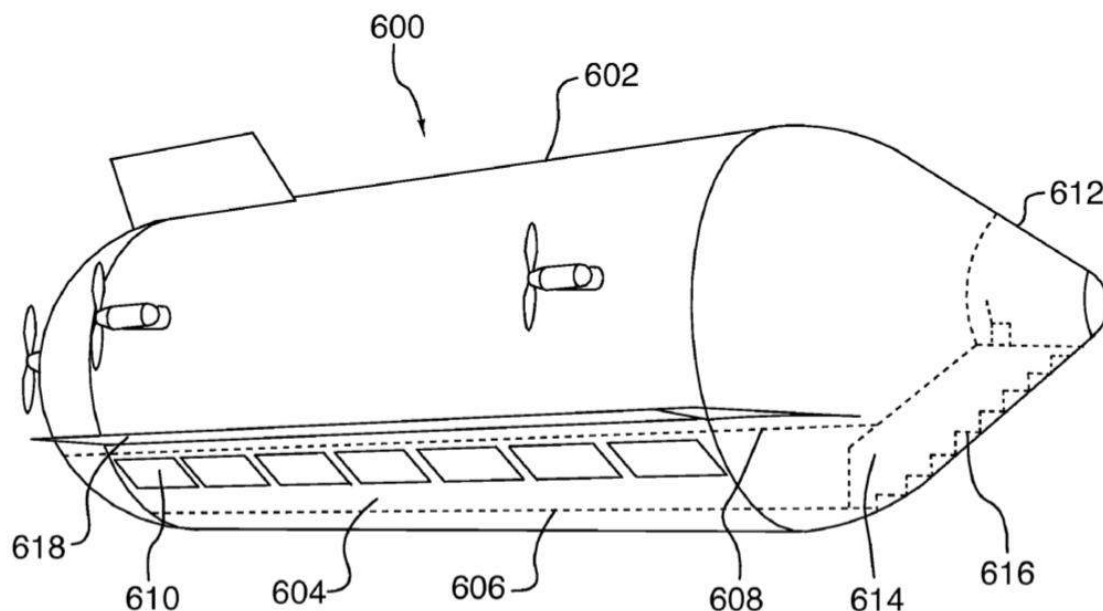


Fig. 23

In the front view shown in patent Figure 4, the placement of the wings (126) and supporting struts (132) are evident. The lifting gas volume (170) is above the passenger and equipment space at the bottom of the semi-rigid hull. The term “H_w” is the distance between the wing root and the bottom of the hull.

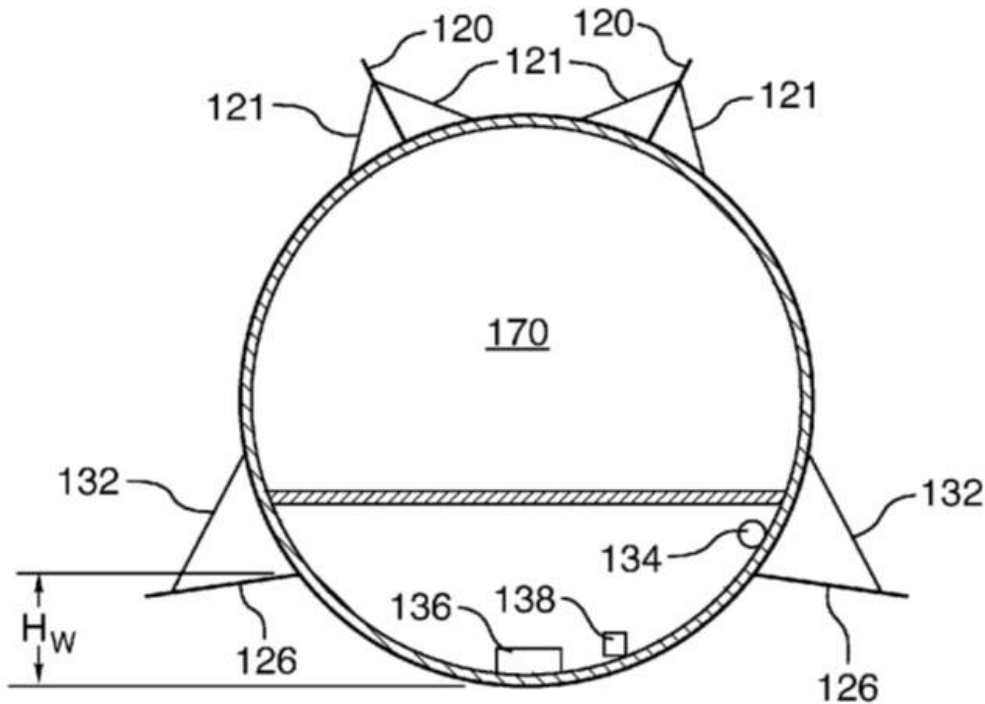
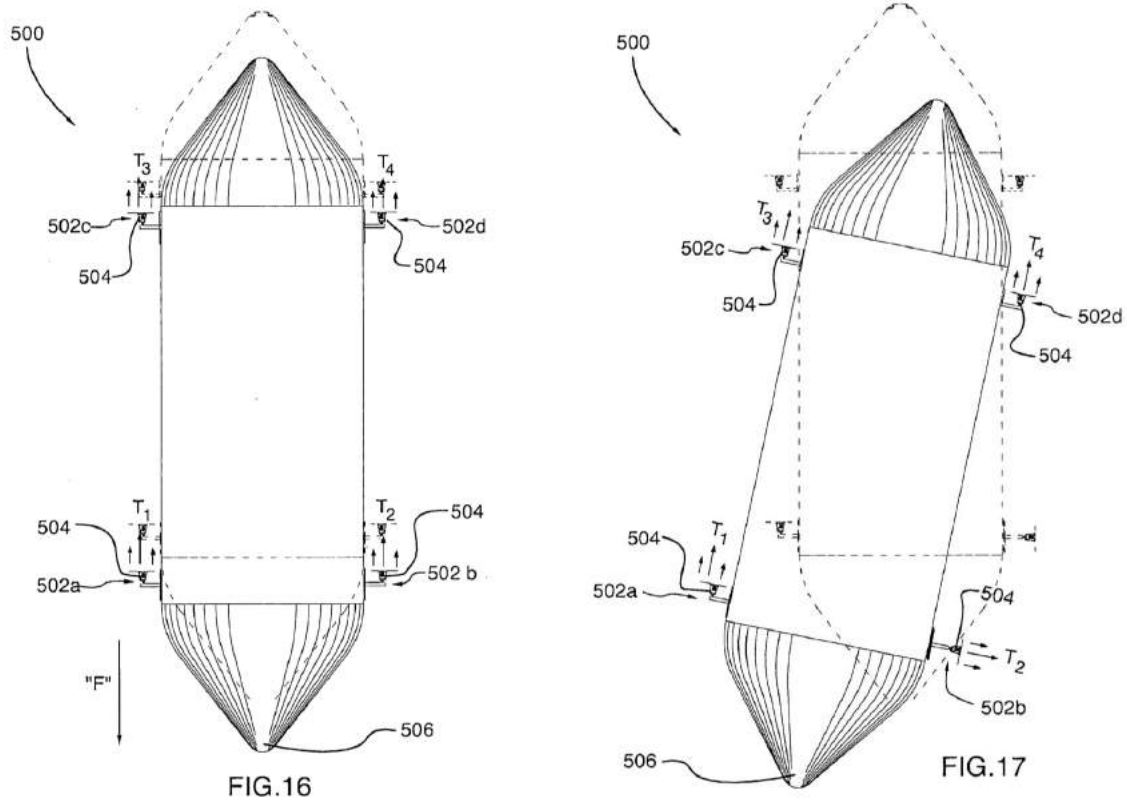


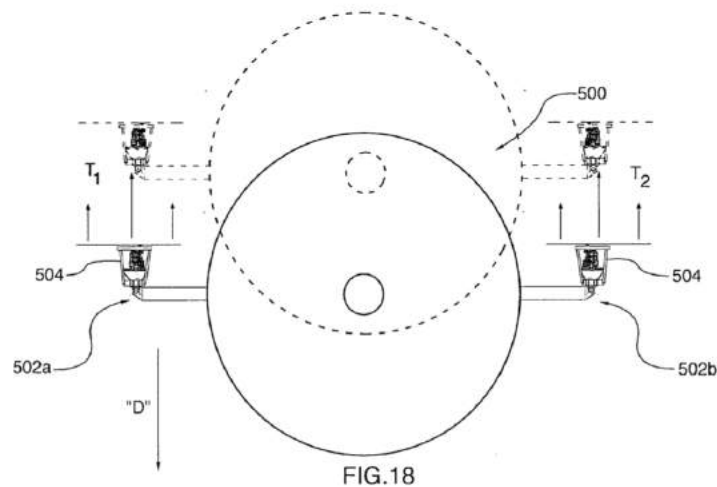
FIG.4

The Flying-Yacht has no conventional external aerodynamic control surfaces. Instead, it has a set of four flank-mounted vectorable propellers that provide propulsion and steering. This appears to be the type of system described by Hokan Colting in patent US20110198438A1, “Propulsion and steering system for an airship,” which was published on 18 August 2011.

Patent Figure 16 shows the four vectored propellers all positioned for forward flight. Figure 17 shows the thrust from the forward left propeller (T_2) vectored to push the nose of the airship to the right.



Patent Figure 18 shows the four propellers vectored to provide upward thrust (T_1 , T_2) that will drive the airship down. Coordinated actions among the four vectored propellers are used to make pitch, roll and yaw changes as needed, and to propel the airship in any direction.



You can read this patent US2011/0198438A1 here:

<https://patents.google.com/patent/US20110198438A1/en?q=US2011%2f0198438A1>

The four vectorable propeller units shown in the Flying-Yacht concept drawings are very compact, possibly like the design described by Hakan Colting in patent US8245966B2, "Airship and vectored propeller drive therefor," which was granted on 21 August 2012.

This patent describes a compact mechanical arrangement with a two-piece propeller drive shaft (31), a gimbal assembly (5), a constant-velocity joint (50), and a means for pivoting the outer section of the drive shaft (48) with the propeller (42) in a desired direction without pivoting the inner section of the drive shaft (44) connected to the prime mover (i.e., an electric motor or engine). This compact physical arrangement is shown in patent Fig. 4.

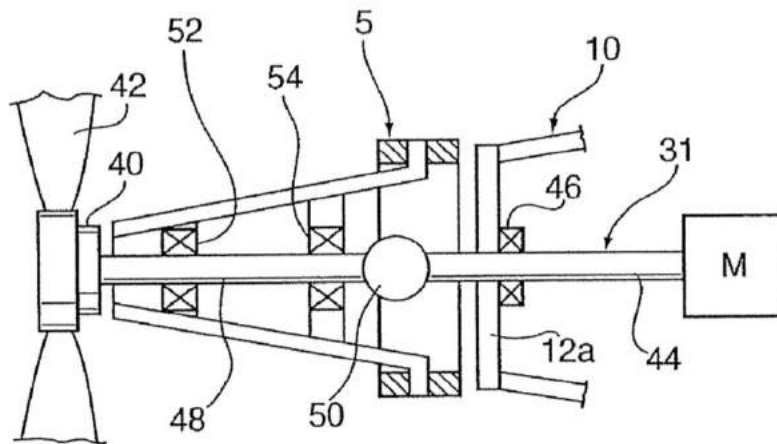


Fig. 4

You can read patent US8245966B2 here:

<https://patents.google.com/patent/US8245966B2/en?q=US8245966>

4. Octuri detailed design concept for sightseeing applications

In collaboration with Yelken Octuri and the Canadian firm OCTURI - Design and Interior, a design concept for a full-scale Flying-Yacht with seating for 40 passengers was developed in 2012 in impressive detail. A unique feature of this airship is the open design of the large passenger deck. This open design is enabled by pressurizing most of the passenger deck to maintain structural integrity. Access to the pressurized area is via a 10-passenger airlock. The Flying-Yacht's passenger area is actually inside what would be considered a ballonnet on a conventional blimp. This design feature also was used in the spherical airships Hakan Colting designed a decade earlier for 21st Century Airships.

Selected graphics from this design study are reproduced below. The Octuri website, with the complete design study for the Flying-Yacht available as a downloadable pdf document, is at the following link:
<https://www.octuri.com/en/aircraft-for-today/the-flying-yacht/>



Rendering showing the general configuration of a Sky-Yacht, with the passenger deck below the helium gas envelope. Source: octuri.com



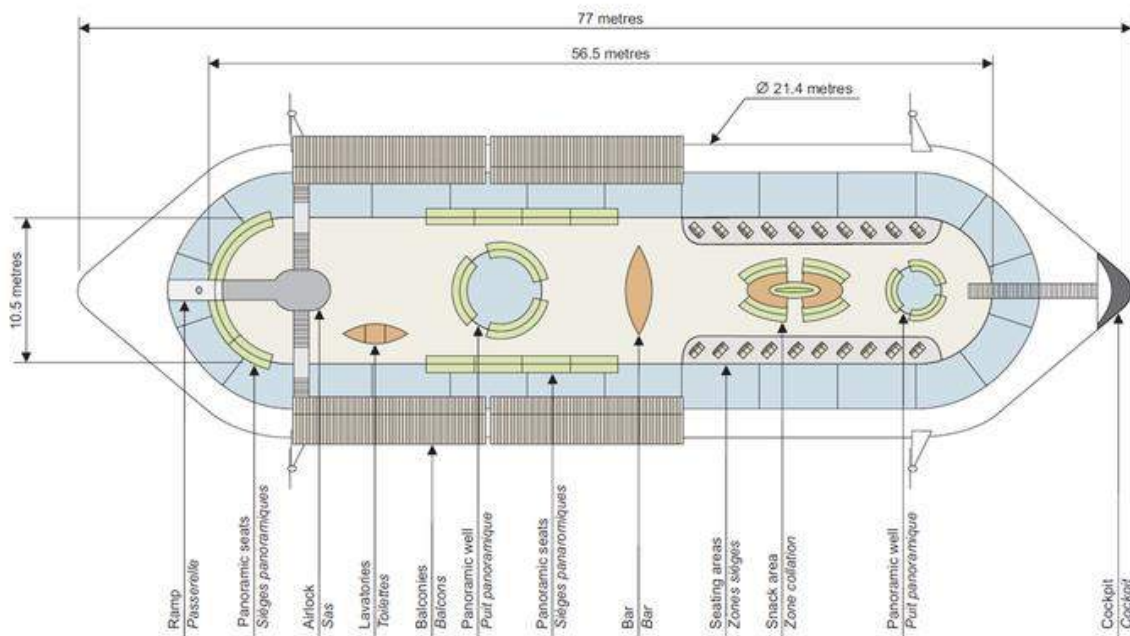
Flying-Yacht is based on the water. Source: octuri.com



The pilot station is in the nose of the craft. Note the four propellers and the open-air balcony above the stub wings and the pressurized passenger deck at the bottom of the hull. Source: octuri.com



*Two round viewing stations can be seen on the bottom of the airship.
Note the long, narrow flank-mounted wings.
Source, both graphics: octuri.com*



Open floor plan of the passenger deck

Octuri describes the interior design as follows:

“The passengers' area is a very large and continuous space.
Since the hull rigidity results from the cabin pressurization,

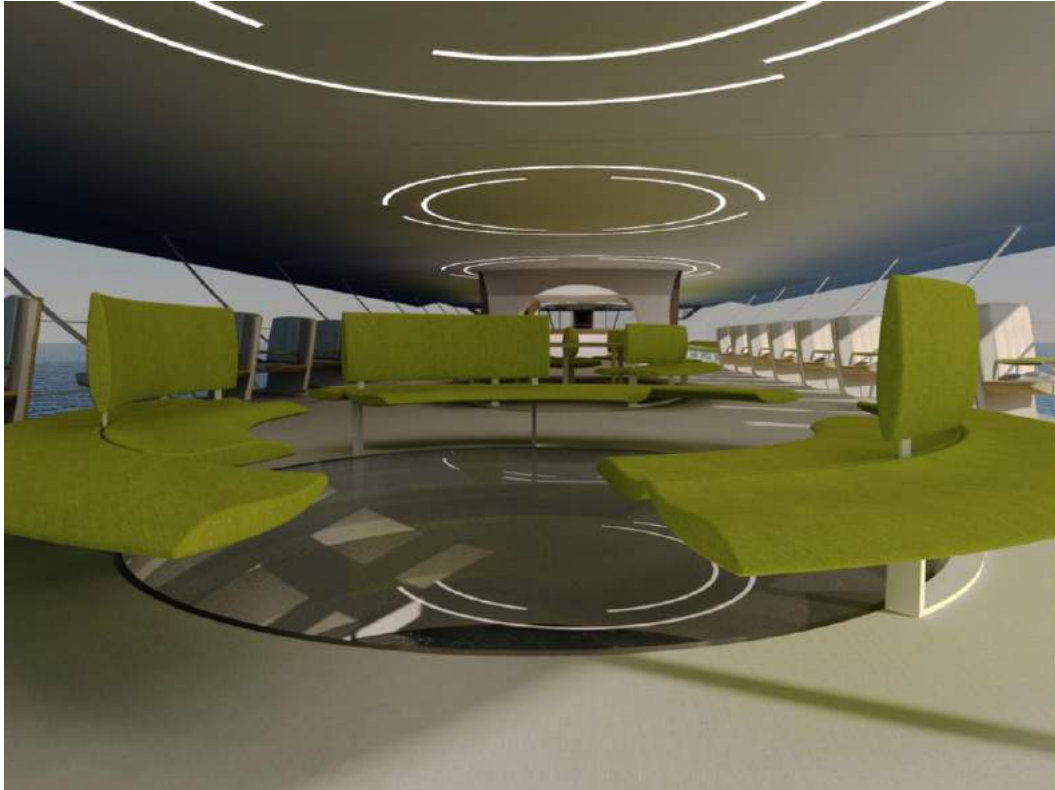
there is no need to resort to structural elements across the cabin. Such a large cabin is hence the result of the innovative architecture of the craft. The cabin's wall is in transparent polycarbonate sheets that ensure a 360° vision, perfectly suited for the flyover of landmarks. The passengers can thus walk across the large cabin while enjoying the panoramic scenery.”

“The layout of the craft features the following elements: the cockpit, the seating areas, the ‘panoramic wells’, the snack area, the bar, the panoramic seats, the lavatories, the airlock, the balconies and the ramp.”

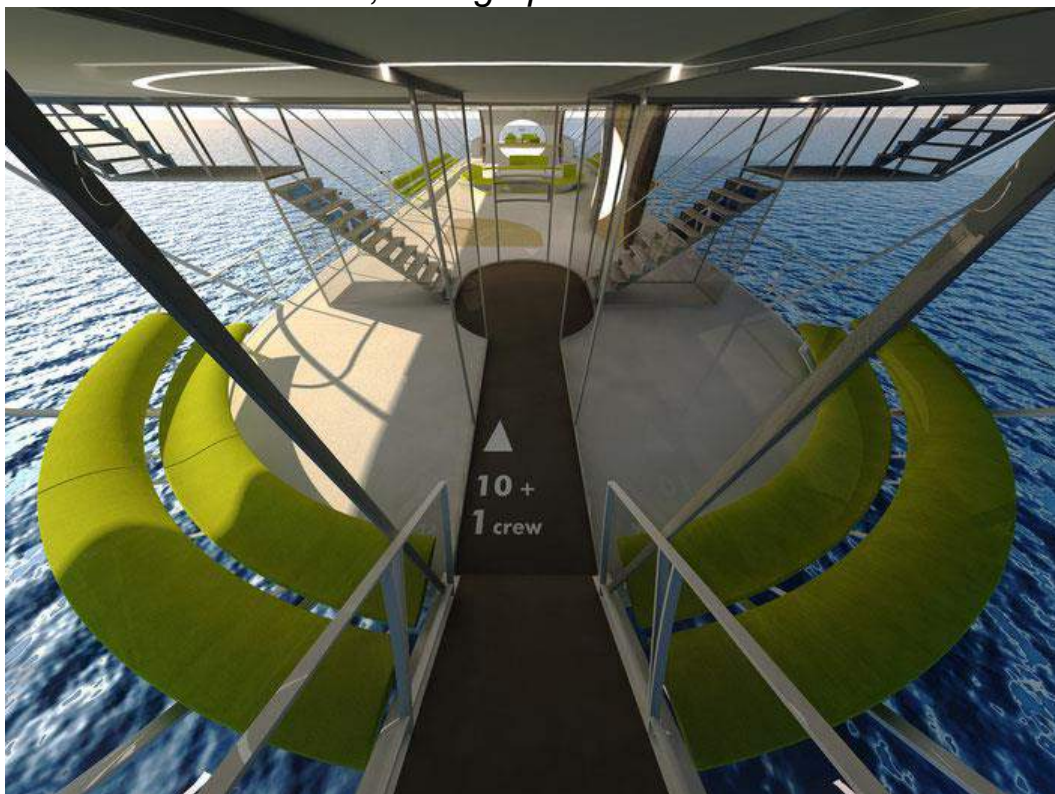
“The passengers enter the airlock in groups of 10 accompanied by a crew member. Thanks to its architecture, the single airlock also leads to the two outside balconies through two stairways. The airlock is surrounded by panoramic seats at the back of the craft.”



*The main passenger compartment looking aft.
Source: Octuri.com*



*"Panoramic well" with a view through the bottom of the airship.
Source, both graphics. Octuri.com*



Exterior view into the pressurized passenger space via an airlock.



Open-air balconies above the flank wings are deployed when the Flying-Yacht is on the water. Source, both graphics: octuri.com

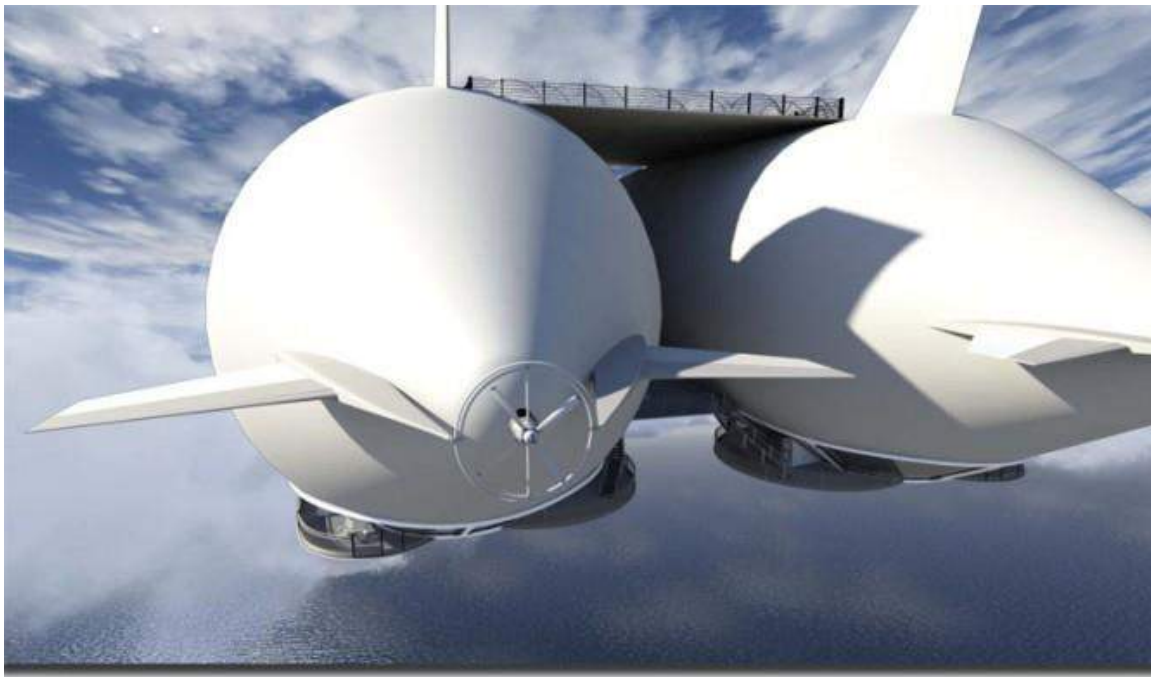


5. Even larger WIG designs

The firm Charter World at one time included several pages on their website showing Flying-Yacht WIG vessels that were then listed as “under development.” Here’s the link:

<https://www.charterworld.com/news/flying-yachts-uniquely-versatile-crafts>

In addition to the single-hull WIG vessel addressed previously, the Charter World website also included the following artist’s rendition of a larger twin hull Flying-Yacht WIG vessel.



*Artist's rendition of a twin hull Flying-Yacht WIG vessel.
Source: Flying-Yacht, Inc. via CharterWorld.com*

Patent US2013/0068879A1 describes this type of catamaran WIG vessel with the following features: two hulls (902), three wings (904, 906) and a structure (908) that joins the two hulls.

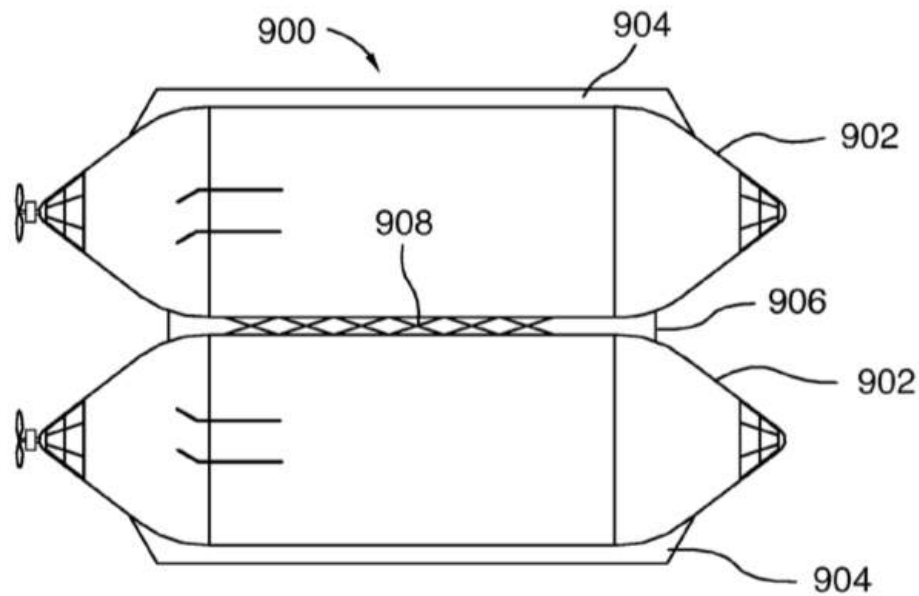


FIG.28

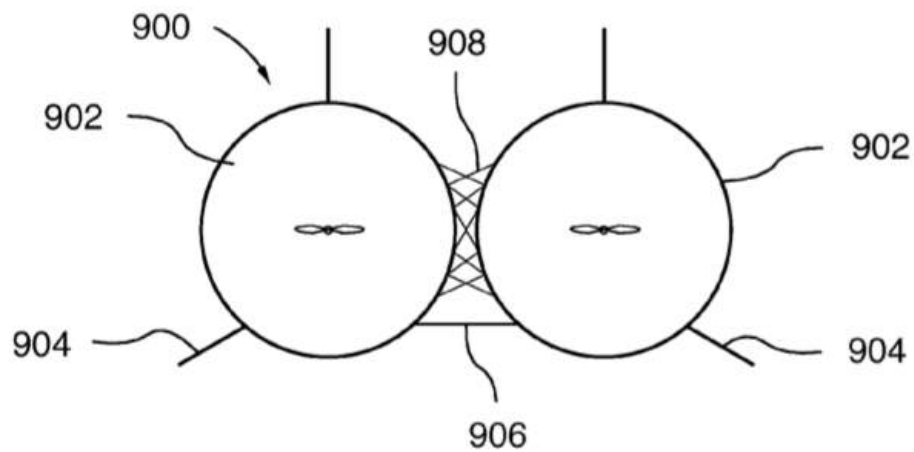


FIG.29

Flying-Yacht catamaran WIG vessel general arrangement.
Source: Patent US2013/0068879A1

The patent notes that operation of the catamaran WIG vessel is “generally similar” to the operation of the single hull WIG vessel. The catamaran could have freight or passenger compartments and “may be operated by crew from a bridge or it may be remote controlled and/or autonomous.”

4. For additional information

Other *Modern Airships* articles

- *Modern Airships - Part 1*: <https://lynceans.org/all-posts/modern-airships-part-1/>
- *Modern Airships - Part 2*: <https://lynceans.org/all-posts/modern-airships-part-2/>
- *Modern Airships - Part 3*: <https://lynceans.org/all-posts/modern-airships-part-3/>